



Pre-Algebra Workbook

Scientific notation

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MATH

POWERS OF 10

■ 1. Complete the statement.

The power of 10 is the same as the number of _____ in the number.

■ 2. Complete the statement.

If you multiply a number by a power of 10, you can count the number of zeroes to know how many spaces to move the _____ to the _____.

■ 3. Find the product.

$$45 \cdot 10,000$$

■ 4. Complete the statement.

When we divide by a power of 10, we move the decimal point to the _____.

■ 5. Find the quotient.



$$6.4 \div 100$$

- 6. Find the product.

$$3.5 \times 10^4$$

- 7. Find the product.

$$1.8 \times 10^{-2}$$

- 8. Find the quotient.

$$420 \div 1,000$$



SCIENTIFIC NOTATION

■ 1. Complete the statement.

Scientific notation has 2 parts. The first part is the decimal number and the second part is the _____.

■ 2. Complete the statement.

The decimal number of a number written in scientific notation must be between 1 and _____.

■ 3. Complete the statement.

The decimal number in a number in scientific notation can be either positive or _____.

■ 4. Write the number in scientific notation.

0.000000056

■ 5. Write the number in scientific notation.

670,000,000,000



- 6. Write the number in scientific notation.

0.00000000000012

- 7. Write number in expanded form.

7.2×10^{12}

- 8. Write number in expanded form.

4.9×10^{-7}



MULTIPLYING SCIENTIFIC NOTATION

■ 1. Complete the statement.

When multiplying two numbers in scientific notation, you'll first _____ the two decimal numbers.

■ 2. Complete the statement.

When you multiply two numbers that have the same base, you _____ the exponents.

■ 3. Write the product $(3.1 \times 10^5)(5.5 \times 10^{-7})$ in scientific notation.

■ 4. Write the product $(1.8 \times 10^4)(5.9 \times 10^6)$ in scientific notation.

■ 5. Write the product $(9.1 \times 10^{10})(1.45 \times 10^{-14})$ in scientific notation.

■ 6. Write the product $(8.8 \times 10^{-2})(7.85 \times 10^{-5})$ in scientific notation.



- 7. Write the product $(1.3 \times 10^3)(2.6 \times 10^{-4})$ in scientific notation.
- 8. If we're given 4.7×10^6 in scientific notation, will we get a smaller or larger number when we multiply it by a negative power of 10?
- 9. If we're given 3.6×10^{-2} in scientific notation, will we get a smaller or larger number when we multiply it by a positive power of 10?
- 10. Yvonne is asked to find the product of two numbers written in scientific notation:

$$(2.8 \times 10^4)(4.46 \times 10^{-6})$$

She solves the problem in three steps.

Step 1 $2.8 \times 4.46 = 12.488$

Step 2 $4 + (-6) = -2$

Step 3 12.488×10^{-2}

In what step did she make her mistake? What is the correct answer?



DIVIDING SCIENTIFIC NOTATION

■ 1. Complete the statement.

When dividing two numbers in scientific notation, you will first _____ the two decimal numbers.

■ 2. Complete the statement.

When you divide two numbers that have the same base, you _____ the exponents.

■ 3. Find the value of $(2.75 \times 10^4) \div (1.6 \times 10^8)$.

■ 4. Find the value of $(1.5 \times 10^8) \div (2.0 \times 10^{-3})$.

■ 5. Find the value of $(6.75 \times 10^3) \div (1.5 \times 10^9)$.

■ 6. Find the value of $(3.6 \times 10^3) \div (1.6 \times 10^6)$.



■ 7. Find the value of $(2.75 \times 10^{10}) \div (8.0 \times 10^8)$.

■ 8. Find the value of $(7.5 \times 10^4) \div (1.5 \times 10^{-4})$.

■ 9. If we're given 5.75×10^6 in scientific notation and we divide it by a negative power of 10, will we get a larger or smaller result?



MULTIPLYING AND DIVIDING SCIENTIFIC NOTATION

- 1. Simplify the expression.

$$\frac{(4.5 \times 10^3)(1.4 \times 10^{-5})}{2.8 \times 10^{-1}}$$

- 2. Simplify the expression.

$$\frac{(7.6 \times 10^5)(1.1 \times 10^{-7})}{5.1 \times 10^{-3}}$$

- 3. Simplify the expression.

$$\frac{(9.7 \times 10^6)(2.4 \times 10^{-3})}{6.7 \times 10^{-3}}$$

- 4. Simplify the expression.

$$\frac{(1.7 \times 10^{-3})(3.4 \times 10^{-4})}{(6.3 \times 10^{-3})(7.3 \times 10^{-2})}$$

- 5. Simplify the expression.



$$\frac{(4.9 \times 10^4)(6.4 \times 10^{-4})}{(8.2 \times 10^{-3})(2 \times 10^3)}$$

■ 6. Simplify the expression.

$$\frac{(6.1 \times 10^6)(6.8 \times 10^{-4})}{(1.1 \times 10^{-5})(1.8 \times 10^5)}$$

■ 7. Complete the statement.

When solving a problem that involves multiplication and division of numbers in scientific notation, you can do _____ first or _____ first.

■ 8. Danny and Deacon are working on finding the quotient below. Danny decides to multiply out the numerator and gets 10,000 for the powers of 10 portion. Then he divides it by 0.00061 to get 16,393,442.6 or 1.63934426×10^7 . Deacon decides he wants to divide, so he divides each number by 0.00061 and gets 819,672,131 and 32.78689852. Then he multiplies those numbers to get 2.68745×10^{10} . Why are the answers different? Who is correct?

$$\frac{(5 \times 10^5)(2 \times 10^{-2})}{6.1 \times 10^{-4}}$$



ESTIMATING SCIENTIFIC NOTATION

- 1. Estimate the value of 9.15×10^4 .
- 2. Estimate the value of 3.65×10^{-5} .
- 3. Use scientific notation to estimate the value $(5.75 \times 10^6)(2.34 \times 10^{-1})$.
- 4. Use scientific notation to estimate the value of $(2.456 \times 10^3)(1.67 \times 10^{-7})$.
- 5. Use scientific notation to estimate the value of the expression.

$$\frac{1.62 \times 10^{-6}}{8.721 \times 10^2}$$

- 6. Use scientific notation to estimate the value of the expression.

$$\frac{7.152 \times 10^2}{2.91 \times 10^2}$$

- 7. Use scientific notation to estimate the value of the expression.



$$\frac{(6.2 \times 10^6)(6.4 \times 10^{-3})}{(4.25 \times 10^{-2})(2.9 \times 10^{-3})}$$

- 8. Use scientific notation to estimate the value of the expression.

$$\frac{(1.7 \times 10^{-5})(2.6 \times 10^2)}{(3.334 \times 10^{-3})(2.5 \times 10^{-1})}$$



